PRODUCT INFORMATION

M-CSF-γ (human, recombinant)

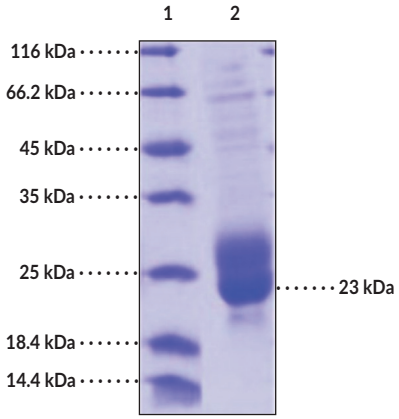
Item No. 32063

Overview and Properties

Synonym:	CSF-1
Source:	Active recombinant human M-CSF-γ expressed in HEK293 cells
Amino Acids:	37-190
Uniprot No.:	P09603-2
Molecular Weight:	18.4 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥85% estimated by SDS-PAGE
Supplied in:	Lyophilized from sterile PBS, pH 7.4
Endotoxin Testing:	<1.0 EU/µg, determined by the LAL endotoxin assay
Bioactivity:	See figures for details

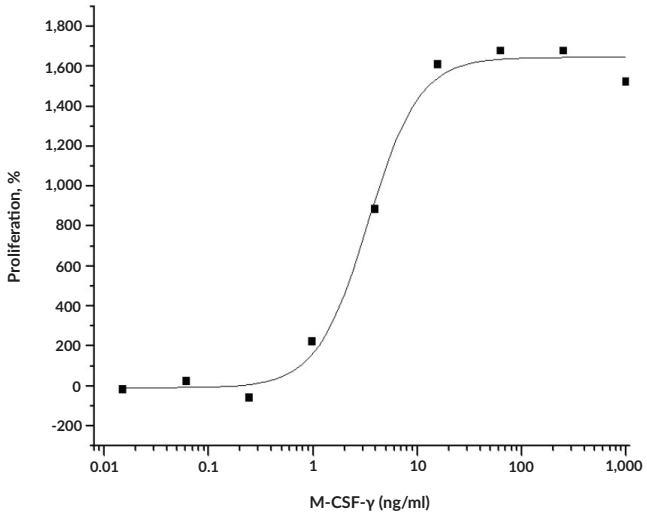
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: M-CSF-γ

SDS-PAGE Analysis of M-CSF-γ. This protein has a calculated molecular weight of 18.4 kDa. It has an apparent molecular weight of approximately 23 kDa by SDS-PAGE under reducing conditions due to apparent post-translational modifications.



Cell Proliferation Assay Using M-NFS-60 Mouse Myelogenous Leukemia Lymphoblast Cells. The ED_{50} value for this effect is typically 1.6-6.3 ng/ml.

CAYMAN CHEMICAL
1180 EAST ELLSWORTH RD
ANN ARBOR, MI 48108 · USA
PHONE: [800] 364-9897
[734] 971-3335
FAX: [734] 971-3640
CUSTSERV@CAYMANCHEM.COM
WWW.CAYMANCHEM.COM

PRODUCT INFORMATION

Description

Macrophage colony-stimulating factor (M-CSF) is a glycoprotein encoded by the *CSF1* gene in humans that promotes the differentiation, proliferation, and function of mononuclear phagocytes, including macrophages, osteoclasts, and dendritic cells.[1,2] Alternative splicing of *CSF1* pre-mRNA produces one full-length long isoform (M-CSF-β), an intermediate-length isoform (M-CSF-γ), and a short-length isoform (M-CSF-α) that share sequence homology in the 150-amino acid receptor binding region that is required for the biological activity of M-CSF.[3,4] M-CSF exists as a disulfide-linked homodimer where each monomer contains four α-helices, an antiparallel β-sheet, and numerous glycosylation sites.[1] M-CSF is constitutively produced by many cell types, including stromal cells, osteoclasts, fibroblasts, and macrophages, and is localized to the cell surface where it can be proteolytically cleaved to yield a secreted form.[5,6] Binding of M-CSF to the M-CSF receptor, which is expressed by monocytes, macrophages, osteoclasts, and dendritic cells, promotes cell differentiation, proliferation, and survival of mononuclear phagocytes and regulates bone resorption by osteoclasts.[5,7] Mice homozygous for *Csf1*^{op}, an inactivating mutation, exhibit defects in fertility and neural development and develop osteopetrosis, a condition characterized by increased bone density.[8] Neutralization of M-CSF with a monoclonal antibody decreases joint swelling and distortion in a mouse model of collagen-induced arthritis.[9] Serum M-CSF levels are increased in patients with colorectal, pancreatic, prostate, or head and neck cancer.[5] M-CSF has been used to generate bone marrow-derived macrophages with an anti-inflammatory phenotype *in vitro*.[2] Cayman's M-CSF-γ (human, recombinant) protein can be used for cell-based assay applications. This protein consist of 158 amino acids, has a calculated molecular weight of 18.4 kDa, and a predicted N-terminus of Glu37 after signal peptide cleavage. By SDS-PAGE, under reducing conditions, the molecular mass of the protein is approximately 23 kDa due to apparent post-translational modifications.

References

1. Stanley, E.R., Berg, K.L., Einstein, D.B., *et al.* Biology and action of colony-stimulating factor-1. *Mol. Reprod. Dev.* **46(1)**, 4-10 (1997).
2. Ushach, I. and Zlotnik, A. Biological role of granulocyte macrophage colony-stimulating factor (GM-CSF) and macrophage colony-stimulating factor (M-CSF) on cells of the myeloid lineage. *J. Leukoc. Biol.* **100(3)**, 481-489 (2016).
3. Cerretti, D.P., Wignall, J., Anderson, D., *et al.* Human macrophage-colony stimulating factor: Alternative RNA and protein processing from a single gene. *Mol. Immunol.* **25(8)**, 761-770 (1988).
4. Fitzgerald, K.A., Callard, R.E., O'Neill, L.A.J., *et al.* M-CSF. *The Cytokine Factsbook and Webfacts*. Fitzgerald, K.A., editor, 2nd edition, *Academic Press* (2001).
5. Chockalingam, S. and Ghosh, S.S. Macrophage colony-stimulating factor and cancer: A review. *Tumour Biol.* **35(11)**, 10635-10644 (2014).
6. Hamilton, J.A. Colony-stimulating factors in inflammation and autoimmunity. *Nat. Rev. Immunol.* **8(7)**, 533-544 (2008).
7. Stanley, E.R. and Chitu, V. CSF-1 receptor signaling in myeloid cells. *Cold Spring Harb. Mol. Case Stud.* **6(6)**, a021857 (2014).
8. Dai, X.-M., Ryan, G.R., Hapel, A.J., *et al.* Targeted disruption of the mouse colony-stimulating factor 1 receptor gene results in osteopetrosis, mononuclear phagocyte deficiency, increased primitive progenitor cell frequencies, and reproductive defects. *Blood* **99(1)**, 111-120 (2002).
9. Campbell, I.K., Rich, M.J., Bischof, R.J., *et al.* The colony-stimulating factors and collagen-induced arthritis: Exacerbation of disease by M-CSF and G-CSF and requirement for endogenous M-CSF. *J. Leukoc. Biol.* **68(1)**, 144-150 (2000).

CAYMAN CHEMICAL
1180 EAST ELLSWORTH RD
ANN ARBOR, MI 48108 · USA
PHONE: [800] 364-9897
[734] 971-3335
FAX: [734] 971-3640
CUSTSERV@CAYMANCHEM.COM
WWW.CAYMANCHEM.COM